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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,610	08/19/2003	Tae H. Kim	501299.01	5996

7590 10/13/2004
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EXAMINER

HO, HOAI V

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/644,610	Applicant(s) KIM, TAE H.	
	Examiner Hoai V. Ho	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/19/03</u> . | 6) <input type="checkbox"/> Other: _____ |

1. This office acknowledges receipt of the following items from the Applicant:

Information Disclosure Statement (IDS) was considered.

Papers submitted under 35 U.S.C. 119(a)-(d) have been placed of record in the file.
2. Claims 1-54 are presented for examination.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4-11, 13-20, 22-29, 31-38, and 40-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Ahn et al. U. S. Patent (USP) No. 5625585.

Per claims 1, 6-10, 15-19, 24-28, 33-37, 42-45, 49-50 and 54, Figure 2 of Ahn is directed to a memory device having first (AR1) and second (AR0) memory arrays sharing sense amplifiers (10) of a sense amplifier region, each memory array having memory cells arranged in rows (WLi) and columns (BLi) of memory cells, a column of memory cells comprising: first (BL, or 21) and second (/BL or 21) digit lines coupled to a sense amplifier (10), each digit line having first (21) and second (24-1) digit line portions (col. 3, lines 11-13 and 21-23), the first digit line portions of the first and second digit lines associated with the first memory array, the second digit line portions of the first digit line associated with the first memory array, and the second digit line portion of the second digit line associated with the second memory array; and a plurality of memory cells coupled to the first and second digit lines. See col. 2, line 64 to col. 3, line 40.

Per claims 2, 11, 20, 29, 38, 46, 47, 51 and 52, Figure 2 of Ahn discloses wherein the

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first digit line portions of the first and second digit lines comprise buried digit lines (21, col. 3, lines 11-13) and the second digit line portions of the first and second digit lines comprise digit lines formed from a metal material (24-1, col. 3, lines 21-23).

Per claims 4, 13, 22, 31, 40, 48 and 53, Figure 2 of Ahn discloses wherein the first digit line portions of the first and second digit lines comprise digit lines formed from a first conductive material (21, col. 3, lines 11-13) and the second digit line portions of the first and second digit lines comprise digit lines formed from a second conductive material (24-1, col. 3, lines 21-23).

Per claims 5, 14, 23, 32 and 41, Figure 2 of Ahn discloses wherein the first digit line is coupled to the sense amplifier through an isolation switch (22) formed adjacent to the first memory array and the second digit line is coupled to the sense amplifier through an isolation switch (22) formed adjacent to the second memory array.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 12, 21, 30 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ahn et al. U. S. Patent No. 5625585 in view of Derner et al. U. S. Patent No. 6301172.

Ahn discloses all the subject matter claimed except for wherein the plurality of memory cells coupled to the first digit line portions comprises a plurality of memory cells having a $6F^2$ semiconductor structure. However, this limitation was well known in the art at the time the invention was made. For example, Derner, starting at col. 1, lines 41 and 42, discloses a plurality of memory cells having a $6F$ semiconductor structure. It would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Ahn's memory cells which utilizes the $6F^2$ semiconductor structure as taught by Derner because Derner suggests that the $6F^2$ memory cells may be implemented as an open bitlines as well as a folded bitline (col. 1, lines 41 and 42) and reduces the size by approximately 25% if comparing to $8F^2$ memory cells (col. 2, lines 13-15). Also see col. 6, lines 28-33.

7. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. Morgan (USP 6574128), Vollrath et al. (USP 6304479) and Takashima et al. (USP 5732010) disclose a memory array with twisted and open/folded bitline pairs.

8. When responding to the office action, Applicants are advised to provide the examiner with the line numbers and page numbers in the application and/or references cited to assist the examiner to locate the appropriate paragraphs.

9. A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned (see MPEP 710.02 (b)).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V. Ho whose telephone number is (571) 272-1777. The examiner can normally be reached on 7:00 AM -- 5:30 PM from Monday through Thursday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on (571) 272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Hoai V. Ho
Primary Examiner
Art Unit 2818



hvh
September 9, 2004